

SOUTH BAY TRS-80® USERS GROUP



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DYNAMIC MEMORIES™

*Tandy Corp./Radio Shack Inc.

JUNE 1983



TRS-80 Mods

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- SHUG meetings are held the third Tuesday of each month in the north east corner of Dysan's building at:

Time - 7:15 to 10:30 PM 5401 Patrick Henry Drive
Santa Clara, Ca

Topic of the month:

Features:

The June meeting will feature hardware modifications chaired by Eric Brewer. Don't forget the first Wednesday meeting on July 6th to discuss programming techniques, problems and answers. Bring your computer.

Send Newsletter articles to:

c/o Robert Hyrd, Editor
South Hay TRS-80 User Group
P.O. Box 60116
Sunnyvale, Ca 94088

Deadline for the June newsletter is; 25 May 83. Please, send articles via modem, or saved on disc/tape. I will see that your media is returned to you. Thanks . . .

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If the need arises, feel free to give one of us a call.

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OBSERVATIONS AT THE COMPUTER SWAP MEET

Spring's Computer Swap America was held, as usual, at the Santa Clara County Fair Grounds. The difference, however, was that the vendors were in two separate buildings.

Last Fall, I had decided it probably wasn't worth going to another swap meet due to the overwhelming crowds and the inability to even get near many of the tables. When they announced over the P.A. in the Fall that the next time they would have more room and apologized for the crowding, I had felt like yelling back that they ought to give us back half our money since we could only get up to half the tables.

The use of two buildings and the availability of advanced tickets seemed to help a lot. In the past I had waited up to three-quarters of an hour for tickets in long lines outside the door. This time, even arriving within a few minutes of opening, it was possible at the smaller

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building, to walk right in. The larger building had a relatively fast moving line in front of it.

There were a few Model I machines for sale buried among assorted other junk items. I didn't see any Model III machines for sale and found the usual domination by Apple hardware items. Bruce Carso (B & C Computervisions) had a fairly large area and big crowds, Gerry McKee was peddling green and amber screens and other assorted items and Bill Richerson was trying to get people to help him clean out his garage by buying assorted items. (I ought to do the same!) Eric Brewer was selling 8" drives and seemed to be generating quite a bit of interest.

There didn't seem to be as many disk drives for sale this time. Maybe most everyone has already bought theirs. I think the most interesting item I saw was an "Apple II" (+ ?) for sale. It actually consisted of a very dirty and greasy keyboard, an equally filthy motherboard and a disk controller and drive all fastened together by ragged looking cables. They appeared to have been hauled into the fair building by dragging them from the car by the cable. It was alleged to be a "working system" for the grand price of \$450. When I went by the table an hour later, it was gone. I guess someone was willing to take a chance. There was even an "Apple" in a wooden case. Many people also had bare or populated Apple motherboards for sale as well as foreign copies.

There were half a dozen or so Osborne systems for sale. It was interesting that some of the used ones I saw were being offered for prices higher than new ones. I saw a new double density Osborne being advertised at \$1300 and a used single density one for more than that. Some of us just can't accept the idea that the minute we take our computer purchase home, it is worth 10% less than we paid for it and every month it becomes increasingly less valuable. Within a couple of years or less we should be able to buy a Model IV for \$1800 or less.

I guess I may go back again even though I only purchased some Epson ribbon refills for \$2.50 apiece. Where else can you get so much entertainment for \$5?

Ian Webb

THE FAMOUS IN OUR MIDST

In case you missed the item in the Sunday paper 05/29/83. The new computer section of the paper quoted three of our members. Gerry McKee, Bill Richerson and Robert Byrd were all quoted on the subject of buying used computer equipment. If you aren't reading the Sunday Mercury-News, you should look for the special computer section.

According to the article, Bill was trying to get working a used Atari he purchased. Abandoning Radio Shack Bill?

Ian Webb

A TREK THROUGH TRSDOS 6.0

If you have been wondering about the new TRSDOS 6.0 for the Model IV machine, here is some information.

It is really a version of LDOS. The banner which comes on at boot up makes that very clear with the copyright message. Its documentation is also very obviously Logical Systems documentation. However, the documentation does not have nearly as much technical information as the older LDOS package. (Is this the usual Tandy effort to keep people unaware of the workings of the system and machine?)

The BASIC is RAM based and DOES NOT USE THE ROM as does the Model III version of BASIC. The BASIC is "fussy" and won't let you run things together and be as careless as you can be with the ROM enhanced Model III BASIC. No more "packed code" with this version of BASIC. It will take some time for me to get used to having to put in spaces and be careful of my syntax.

Interestingly enough, the operating system has a DEBUG which allows you to read from and write to disk quite easily. It is somewhat like the RSM package for the Model I and III. Perhaps Radio Shack had to accept what LDOS already had available and didn't convince them to keep the user out of the system.

The TRSDOS 6.0 diskette will not boot up in a Model III, but it can be viewed by Supsr Utility or SUPERZAP and modified just like any other diskette on a Model III.

I am not acquainted with the directory format in LDOS for the Model III, but I did some exploration with the TRSDOS 6.0 format and found it not unlike the typical Model I and III NEWDOS 80 directory. The HIT and GAT tables are in similar locations and look very familiar and the directory entries include the system files logged in traditionally, unlike TRSDOS for the Model III where the system entries are unconventional. "Killed" (REMOVE in TRSDOS 6.0) files do not have their directory entries cleared as in unmodified TRSDOS for the Model III.

The GAT table uses F8 to indicate an empty track, F9, FB and FF are the codes for successively fuller tracks. The rest of the directory entries seem to follow the Model III TRSDOS format fairly closely with the same bits

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indicating system, limited backup, etc. It didn't take much effort to go into the directory and change system files or change the protection and access status by zapping the disk. This can be done directly from DEBUG by writing a section of the disk to memory, changing memory and then writing the changed memory back to the diskette.

An interesting thing is how the date is entered. (LDOS keeps dates for all files.) In four and a half years, we'll have to get new copies of the operating system or patch the system, since it only can handle a limited number of dates. The second and third bytes of the directory entry for each file contain the date of creation. The three least significant bits are the year in the form of the number to be added to 80. In other words, it starts with 1980 and can go to 1987 since only 3 bits are allocated to this function. The next 5 bits are the day, using up the entire third byte. The 4 least significant bits of the second byte are the month. I didn't figure out what the four higher bits of that byte are for since I couldn't discover an obvious relationship for their value. The first bytes of the directory entry is similar to the Model III TRSDOS format, including the level of access.

The passwords for update and access are in the same directory position as in Model III TRSDOS and the familiar 96 42 is the default password. The directory is on the track (cylinder) half way between the beginning and ending cylinder. The directory location seems to be specified by the third byte in the boot track, as I formatted a diskette with 42 cylinders and the third byte changed to reflect the placement of the directory on cylinder 21.

On a non-system disk, there seemed to be a duplicate directory in the first cylinder of the diskette. I haven't had time to investigate this further. I didn't find the byte which indicates the number of allowed backups if this feature has been included as in Model III TRSDOS. Maybe someone will let us know if their investigations find out more about this.

Maybe those with Model IV machines will publish for us their discoveries as they spend more time investigating their machines and the differences between the Model III and the Model IV.

My overall impressions at this point? I wonder when NEWDOS 80 for Model IV will be available?

Ian Webb
IANWEBB @ SBUG-80

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THE SATELLITE KEY BOARD

After working with a 16K level 2 cassette machine for about 4 years, I built the LNW expansion interface and added disc to the system (in actuality a friend built it - being fumble fingered, he did not think I was to be trusted with a soldering iron (in actuality his wife and daughter did most of the soldering - he isn't fumble fingered, they were just picky)).

The first thing I noticed was the small amount of ksyboard movement I now had because of the short cable connecting the keyboard to the expansion interface. Being the electronic genius that I am, I decided to find someone who could tell me how to use a longer cable. The first avenue I took was to ask my local friendly Radio Shack computer expert exactly how long the cable could be and still work, his response was to ask me to definis Model I and expansion interface. I had a hunch that this was a dead-end street, so I decided to explore other ways to free up the keyboard.

Having become disillussioned with the computer expert, I next decided to go to my C.B. repairman (logical if you think about it, the C.B. is used to communicate and the keyboard has to communicate with the processor and expansion interface) who just happened to own a model I computer with a short cable that irritated him. Being the psychological genius that I am, I convinced him that there must be a way to make the cable longer and that the perfect place to try it was on his computer since he had already done some modifications on it.

The suggestion I made was to remove the CPU board from the keyboard case and place it in a box along with the LNW board. This would allow the use of an ultra short cable (3 inches) from the CPU to the expansion and a long cable from the keyboard to the CPU. Since I had convinced him that there would be no problems involved with the conversion, he went home and dismantled his computer. Two weeks later he called me to let me know he had managed to get it to work and only had a few minor problems with disc and memory. One week later he called and let me know that the difficulty with the disc and memory had been the length of ribbon cable he was using (19 feet).

I then told him that I would be interested in doing the same to my machine, IF he could show me that it really worked (being the software genius I am, I know that hardware can't be trusted - it always make the software act like it has bugs). After a month of him insisting that it worked, I decided to take the plunge. So one saturday, machine in hand, I headed over to his garage for what he told me would be a 2 hour job. 1 1/2 hours later, I had a keyboard that was separated from the CPU by a 1 1/2 foot cable.

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It has worked with no glitches for the last 9 months and I love it. Friends come over and we play games at the kitchen table with just the keyboard, the rest of the machine sits on my desk in a corner of the room making it easy for all to see the monitor. The modification is fairly simple to do, and costs very little. Since Will and I did ours, two other friends have done theirs (one with the LNW and one with the RS EI). The only materials required are a box large enough to hold both boards, ribbon cable to run from the boards to the connectors on the box and keyboard case, four RS232 connectors (2 mals and 2 female) and about 10 feet of 25 wire shielded RS232 cable. The total cost (if you have to buy at retail) should be under \$75.00, if you are good at acrounging it could be much less (I got away for about \$10.00).

The modification is done as follows:

- 1) Remove the 2 printed circut boards from the keyboard case.
- 2) Remove the short ribbon cable connecting the boards (the best way is to cut it in half and work on one board at a time). The holes must be cleaned out (a solder sucker is great if you have access to one).
- 3) Cut an opening in the back of the keyboard for an RS232 connector. It will have to be bolted in place.
- 4) Solder a piece of ribbon cable (20 wires) to the RS232 connector on pins 1 thru 20 (it is best to connect them in sequence 1 to 1, 2 to 2 etc.). The connector is done first since it is easier to work with it when the other end is free to flop around.
- 5) Solder the other end of the ribbon cable to the pc board making sure that each pin from the RS232 connector goes to the proper pin on the board. You should also verify that the length of the ribbon cable is sufficient to reach the edge of the case when the board is installed.
- 6) Repeat steps 4 and 5 with the CPU board.
- 7) Solder connectors on each end of a length of 25 wire RS232 shielded cable. You can use ribbon cable but the RF interference will be greater and the cable will have a tendency to transmit noise from electric cords it may come in contact with.
- 8) Install the expansion board and CPU board in the box
- 9) Plug the cable into the connectors on the box and keyboard.

I have eliminated some of the work involved in this conversion from the steps above. They involve the construction of the box, installation of switches for lowercase modes and the method of installing the boards in the new box. The methods used for these items will vary from machine to machine. If you taskle this, feel free to get in touch with me for sny information you need.

Glenn Vsughn
GLENN @ SBUG-80

ALWAYS GET BEFORE YOU PUT or How To Peck Random Files

When I got my TRS-80 I felt that I needed a project to provide some focus for learning to program. The project that I selected was to write income tax programs that would do all the work and print the tax form. As it turned out that was a rather ambitious undertaking. In the process I not only learned a great deal about programming but also learned a lot about the income tax system. It has been a most rewarding although sometimes frustrating experience.

In the design of the program I soon found that to do it right I would have to break it up into modules, each module representing one page of the form. This required a common data file, because much of the data is required on more than one form and data generated on one form such as SCHEDULE D (capital gains) had to be transferred to the basic 1040. As a result I followed a design approach which put the local data from a form in a sequential data file specific to that form. All results of processing that form were placed in a common random file. One additional common file was established which I call HEADER which is also a random file but contains all the relevant data concerning filing status, names, social security numbers, etc. This file is a more or less permanent file specific to a particular taxpayer and gets changed very little but accessed a lot for names and filing status.

All the descriptions that I had read about random files described the usual repetitive file structure that is used with mailing lists etc. I decided that was too inefficient with file space and decided to pack the files as much as possible. To keep track of where things were placed I designed a file map which is essentially a map of a sector. A copy of one of these maps is shown in figure 1. As you can see the allocations are of various lengths even as short as one byte. The table at the bottom lists the contents of those locations that are too short to fill in place. This is the first sector of the file named HEADER. Figure 2 shows the file map of one sector of the common data file. Each entry uses eight bytes which is enough to accurately represent the largest numbers likely to be needed on a tax form for almost any TRS-80 user. On this particular sheet the variable representing that date on sheet 2 of Form 1040 is also shown for my own reference.

These have no relevance to this article except that it further demonstrates the value of the map.

When I began to use the system of files as designed I found that in some circumstances the random files were contaminated with garbage. Once it is understood how the file buffers work it is easy to understand the source of the garbage. When a buffer is used to transfer data to or from the disk the data is not erased when the transfer is

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completed and thereby hangs the tale of the name of this article. I will try to succinctly and clearly describe the process in the words that follow.

Referring to the file map, figure 2, suppose that I have completed a SCHEDULE D and want to save the final gain or loss to the common file. If I start with a blank buffer and store the eight bytes representing the gain or loss in bytes 65 through 72 and then PUT that data I will end up with a blank sector on the disk, except for bytes 65 through 72. If I had started with a buffer that had been used for some other sector and had added the data to it I would end up with a sector with the wrong data in it, except for the eight bytes. The solution is to GET any sector that you want to partially load before you PUT anything in it. In this way you bring in the existing data in the sector, change it with the new data and put it back.

In most instances where you are dealing with volatile information and where few records are involved it is always good insurance with little extra overhead to GET the sector before you PUT anything into it. Obviously, if you are going to completely rewrite a 100 sector random file there is no need to do this. If the sector is completely rewritten for any transaction there is no need to GET it first.

Although this all seems rather simple and obvious when you understand it, I confess that the problem took quite a bit of head scratching on my part before I finally got it all put together. I hope that this will save some of the rest of you who haven't yet been confronted by the problem from reinventing another square wheel.

NOTE: Refer to pages 13 & 14 for figures 1 & 2.

Tom Anderson
ANDERSON @ SBUG-80

***** P H O N E S P H O N E S P H O N E S

Anyone communicating with SBUG's bulletin board knows at least something about phones. You know voice signals can be sent both ways, but computer data CANNOT transmit and receive simultaneously. This is all you need to know concerning telecommunications. What about other uses of the phone?

In this first of a series of articles, I will describe some of the basics of phones, and some of the things I will discuss in the future.

When you look into the little grey box on the wall, you will notice, usually, 4 wires colored red, green, black and yellow. All that is need to operate your phone is red

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and green. Any other wire controls modems in one way or another, either transmit levels or answering control. The important wires are called tip (green) and ring (red). When voics or data are transmitted, it is done differentially (no polarity). One thing you learn quickly is the difference in AC signals (voice), and DC potentials (signaling voltage).

When your phone sits quietly on the wall or table, a measure of the tip/ring will show 12-48 volts DC. This is called 'ON-HOOK'. In the 'OFF-HOOK' condition, the tip/ring will measure 5-8 volts DC. The lower voltage condition lets the computer in the central office know to send your dial tone. You may have noticed at times that you don't get a dial tone. Usually this is because the computer is simply too busy to see you. Then, just as if the phone company knew you had a hard day, RRRRRRRRINGGGGGGG!!! The central computer received your number and sent about 50-100 volts AC to your phone. This AC voltage is riding on a DC level (MENTIONED ABOVE) for "ON-HOOK." In case you're worried, this will give you a shock if you happen to be holding the wires when it rings, but nothing harmful. Essentially, this covers the phone!

Here are a few tricky parts to keep you interested until next time:

- 1) How does the modem recognize a ring and auto answer?
- 2) How does a phone separate your transmitted voice (or data) from what you are receiving?
- 3) What are all those other wires for?
- 4) How do I safely connect other things (dialers, answering equipment...) to the phone lines?
- 5) How do I dial tones and pulses?

Make sure to save your Dynamic Memories, because over a period of time, I will refer to them. And, if you have questions or comments (also requests for future articles) Please let me know via *MAIL on SBUG-80 (BBS) other members can leave a note with a club officer.

Until next time...

Ronal Thompson
RONAL @ SBUG-80

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SBUG-80 MAIL CORNER

<Message from GLENN at SBUG-80 05/19/83 21:02:37>
RE: DOSPLUS --> NEWDOS80

It seems to me that NEWDOS80 will read single density DOSPLUS disc's. I could be wrong but the major difference between NEWDOS & DOSPLUS is that NEWDOS uses logical tracks (10 sectors per track) and DOSPLUS uses physical tracks

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(number of sectors per track depends on disc type). If the disc is single density then the disc directory is located on track 17 (sector 170) in either DOS. If the disc is double density then the directory is located in actual sector 170 under NEWDOS but is located in track 17 (sector 306) under DOSPLUS. Since 306 is not evenly divisible by 10, NEWDOS can't find it. If any of you would like a more detailed explanation of the differences between physical and logical addressing on disc (or in memory).

<Message from JLYNCB at SBUG-00 05/21/83 17:16:04>
RE: DOS+ TO NEWDOS

The easiest way that I have found to transfer from DOS+ to NEWDOS is by using single density. In DOS+ you first format a disk for single density and then transfer or copy your programs or files. In NEWDOS you use the PDRIVE for single density (9 on the version that I use) and copy from the single density disk to NEWDOS. You use it on both DOS+ and NEWDOS - both systems work with single density formatted disks in drive 1.

John Lynch (JLYNCB)

<Message from RON at SBUG-00 05/25/83 13:50:54>
RE: WANTED: 35 TRACK DRIVE FOR \$50 (NO CASE)

ANYONE HAVE AN OLD (WORKING) 35 TRACK DRIVE WITHOUT CASE THAT THEY'D BE WILLING TO SELL FOR AROUND \$50? (I.E. SOMETHING VERY CHEAP BUT RELIABLE). THANKS.

<Message from IANWEBB at SBUG-00 05/31/83 06:40:19>
RE: MODEL IV TECHNICAL REFERENCE MANUAL

I called Radio Shack National Parts to find out about the "Technical Reference Manual" (26-2110) which is mentioned in the TRSDOS 6.0 manual. They say "it is not listed in the computer." If anyone finds out about this and has a source for it I would like to know.

<Message from BILLRAM at SBUG-00 05/32/83 15:10:17>
RE: SUPERSCRIPSIT PRINTER DRIVER

Has anyone tried to write a custom printer driver for the DTC 302? I use only superscripts now and would like to use all the capabilities of the 302 (in the driver itself, not just in the printer codes). I would be willing to work with someone who has more ability and knowledge than I do in assembler. Help!

<Message from IANWEBB at SBUG-00 06/03/83 10:05:36>
RE: MODEL IV

Anyone who wants information on the PLA (PAL?) to allow them to add the additional 64K RAM to the Model IV can give me a call. I have ordering information and price from Radio Shack National Parts. You need that and the

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8 64K RAM chips to make the conversion.
Ian 867-9533

<Message from IANWEBB at SBUG-88 06/05/83 10:57:55>
RE: CP/M FOR MODEL 4

The word I now receive when asking about CP/M is that the target date is August for the "authorized RS" version for the Model 4. They claim this is a "real" date and not a Superscript type date...that was at least 6-9 months late if you don't remember!

<Message from IANWEBB at SBUG-88 06/05/83 18:59:55>
RE: SuperScript - new version NEWDOS80 patches

For those who have authorized versions of Superscript, there is an updated version. The earliest ones didn't have a version number on the line above the main menu. This one does.
The NEWDOS80 patches from Apparat DO NOT work on this newer version. The same code does occur in this version, but at different addresses. I imagine there needs to be an adjustment of jumps or calls to take care of it. Does anyone have the patches for the newer version?

<Message from IANWEBB at SBUG-88 06/11/83 14:00:14>
RE: 128K FOR MODEL IV

I can report on the Model IV conversion to 128K now. Received the PAL from National Parts (\$30 approx) and bought the 64K RAMS from Bruce at B&C Computervisions. (\$45 approx). They just plug in and although the only way to access it now is through the RAMDISK provision of TRSDOS 6.0, it is interesting to be able to load the entire operating system in the other bank of memory, set the system disk to that RAMDISK and then have all drives free for other use. Suspect we will see info on using the other bank in the next few months. Until the tech manual is available from Radio Shack, it will not give you much advantage to have the 128K.

<Message from IANWEBB at SBUG-88 06/11/83 14:05:36>
RE: T R S D O S =====> I B M

Some was asking a while back about TRS to IBM conversion. (Bill Ramsay????). See page 70 of July 80 Micro for an ad from Personal Computer Products, 1488 Coleman Ave, Suite C-18, Santa Clara (408) 988-8164, for a program to file transfer --- \$89.95.

<Message from IANWEBB at SBUG-88 06/11/83 14:18:02>
RE: COLOR Model II/12/16

See pages 74-75 of June 6 TIME Magazine for a color Tandy Model II/12/16....artistic license?

FILE NAME HEADER

SECTOR 4

- 1 FILING STATUS 1, 2, 3, 4, 5
- 2 CONTRIB TO PRES ELECTION ? YORN
- 3 SPOUSE CONTRIBUTION YORN
- 4 IN CITY LIMITS YORN

- 13 -

SECTOR MAP

11/28/82

FILE NAME IT/DAT

SECTOR B

1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
																16
																32
																48
																64
																80
																96
																112
																128
																144
																160
																176
																192
																208
																224
																240
																256

FIG 2

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FIRST CLASS MAIL